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TIMBERS

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DEPARTMENT OF TRADE AND COMMERCE

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COMMERCIAL INTELLIGENCE SERVICE SD 437. AS. 1933

L. D. WILGRESS, *Director*

CANADIAN EXPORT TIMBERS

THEIR PROPERTIES AND USES

PREPARED BY

The Forests Products Laboratories, Forest Service,
Department of the Interior,
Ottawa, Canada

PREFACE

THE increasing determination of the people of the United Kingdom and the other Empire countries to give preference to the purchase and use of products of the Empire, has directed keen interest to Canada's forest resources, particularly as Canada is practically the sole Empire source of supply of many of the softwoods which are in such universal demand.

It has been decided therefore that the present is an appropriate time to issue a publication describing the properties and uses of the Canadian timbers of importance from an export standpoint.

While the publication is intended primarily for the information of architects, contractors, builders, etc., it has been prepared upon lines sufficiently broad to provide general information to all persons interested in the sale or use of Canadian timbers.

Canadian timbers are handled by the leading timber brokers and importers of the United Kingdom and other countries, to whom interested readers are referred. Alternatively, the Canadian Government Trade Commissioners, a list of whom is given on the inside back cover of this publication, will gladly furnish information and addresses of suppliers, upon application.

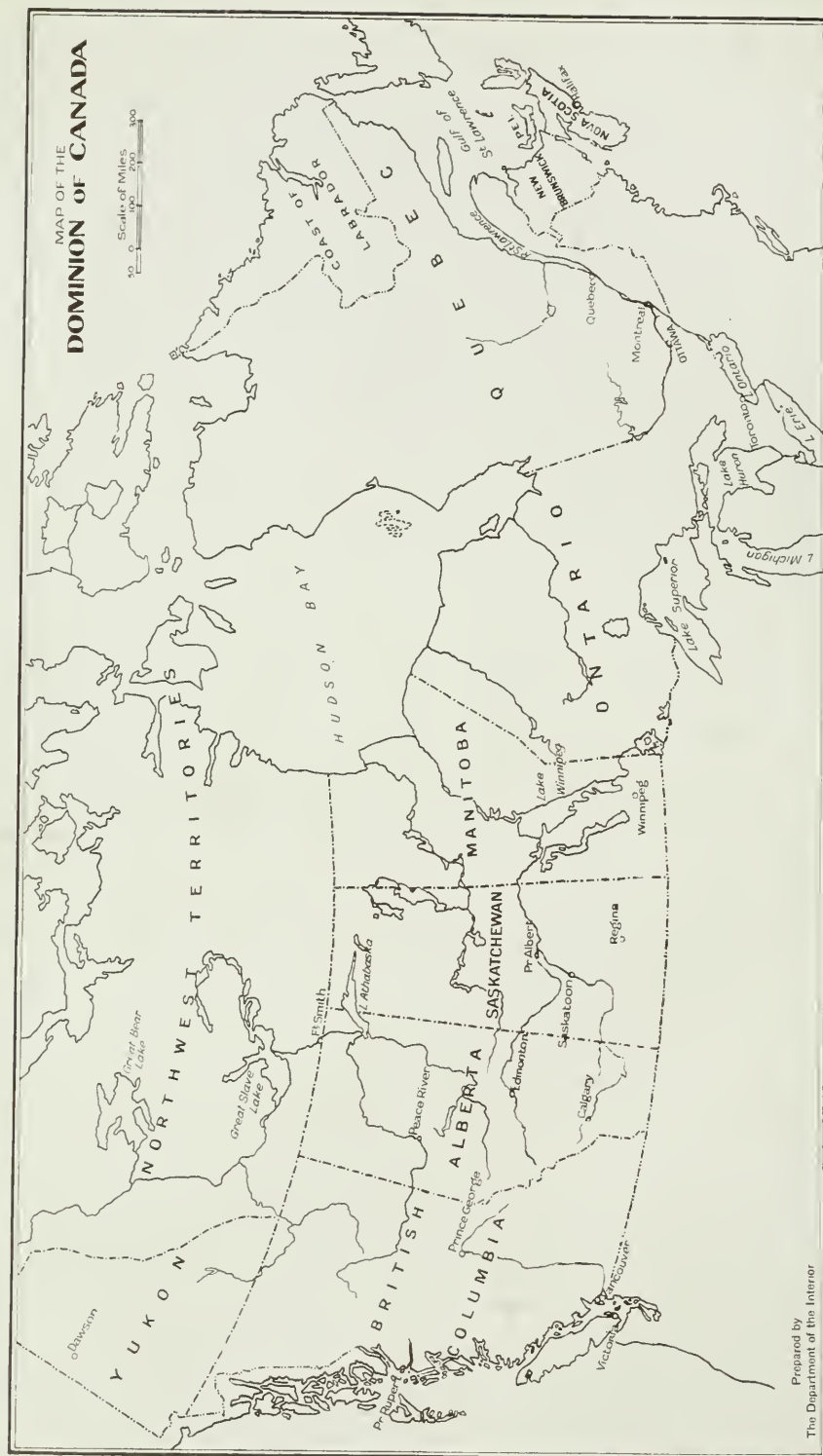


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EXPORT TIMBERS OF BRITISH COLUMBIA

SOFTWOODS:—Douglas Fir, Western Hemlock, Western Red Cedar,
Sitka Spruce, Western White Pine.

EXPORT TIMBERS OF PRAIRIE PROVINCES

SOFTWOODS:—Spruce, Jackpine.
HARDWOODS:—Poplar.

EXPORT TIMBERS OF EASTERN CANADA

SOFTWOODS:—Canadian Spruce, White Pine, Red Pine, Eastern
Hemlock, Jack Pine.

HARDWOODS:—Yellow Birch, Sugar Maple, Basswood, White Birch,
White Elm, Rock Elm, Poplar.

Canadian Export Timbers: Their Properties and Uses

FOREST AREAS

The total land area of Canada is approximately 3,690,000 square miles, of which about 31 per cent or slightly over 1,153,000 square miles is forested. The accessible and productive forest area is estimated to be 791,670 square miles, of which slightly less than one half carries timber of merchantable size. Softwoods or conifers predominate on 481,790 square miles. Mixed forests of softwoods and hardwoods cover about 213,790 square miles and hardwoods in fairly pure stands cover 96,290 square miles.

In British Columbia and the Prairie Provinces, with the exception of poplar, the hardwoods are of limited importance. In Eastern Canada, however, there are large quantities of valuable hardwoods including birch, maple, beech, poplar, elm, basswood, and other less important species. Birch and maple are of particular value in the export trade.

FOREST RESOURCES

It is estimated that Canada has altogether 267,733 million cubic feet of standing timber of merchantable size. Of this, 165,844 million cubic feet is accessible to existing means of transportation. The accessible timber of a size suitable for sawing is estimated to amount to 63,560 million cubic feet (290,230 million feet board measure). The remaining 102,284 million cubic feet is, for the most part, young timber which can be used for pulpwood, fuel, fence posts, etc.

British Columbia leads in accessible saw timber, having about 53 per cent of the total of such material; the Eastern Provinces have about 40 per cent, the remainder being in the Prairie Provinces. Eastern Canada has, however, large resources in the smaller timber suitable for pulpwood, cordwood, etc., its forests containing nearly 80 per cent of the total amount of such material.

CANADIAN TREE SPECIES

There are in Canada over one hundred tree species. These may be divided into three general classes:

- (1) Those of export as well as domestic importance.
- (2) Those of importance only for the domestic market or for shipment to the United States.
- (3) Those of no commercial importance.

CANADIAN EXPORT TIMBERS

In this publication it is proposed to deal in detail with the woods in the first class only; to give a list of the timbers in the second class; and to disregard the third class, details with respect to which may be found in technical publications by those interested.

In the first class are included the following woods:

SOFTWOODS OR CONIFERS

PINES

- White pine: *Pinus Strobus* L.
- Western white pine: *Pinus monticola* Dougl.
- Red pine: *Pinus resinosa* Ait.
- Jack pine: *Pinus Banksiana* Lamb.

SPRUCES

- Canadian spruce
 - White spruce: *Picea glauca* Voss.
 - Black spruce: *Picea mariana* (Mill.) B.S.P.
 - Red spruce: *Picea rubra* Link.
- Sitka spruce: *Picea sitchensis* (Bong.) Carr.

HEMLOCKS

- Eastern hemlock: *Tsuga canadensis* (L.) Carr.
- Western hemlock: *Tsuga heterophylla* (Raf.) Sarg.

DOUGLAS FIR: *Pseudotsuga taxifolia* (Lamb.) Brit.

WESTERN RED CEDAR: *Thuja plicata* D. Don.

HARDWOODS

POPLAR

- Aspen poplar: *Populus tremuloides* Michx.

BIRCHES

- White (Paper) birch: *Betula papyrifera* Marsh.
- Yellow birch: *Betula lutea* Michx.

ELMS

- White elm: *Ulmus americana* L.
- Rock elm: *Ulmus racemosa* Thomas.

MAPLE

- Sugar maple: *Acer saccharum* Marsh.

BASSWOOD

- Tilia glabra* Vent.

CANADIAN EXPORT TIMBERS

The following table indicates approximately the quantities of these timbers of size suitable for sawing into lumber which are now considered accessible in British Columbia and the Eastern provinces. Not all of this timber under present conditions can be considered accessible from an export standpoint, but it would be impossible in many cases to give, with any degree of exactitude, the percentages of the forest resources which may be considered exportable. The quantities given will, however, indicate those timbers available in large quantities and also those of which supplies are more limited.

APPROXIMATE QUANTITIES OF ACCESSIBLE SAW MATERIAL OF THE
PRINCIPAL EXPORT TIMBERS OF CANADA

Timber	Thousand Standards	Million feet board measure	Region to which figures pertain
White pine	4,343	8,600	Eastern Provinces.
Western white pine	460	910	British Columbia.
Red pine	1,417	2,805	Eastern Provinces.
Jack pine	5,833	11,550	Eastern Provinces.
Canadian spruce	25,010	49,525	Eastern Provinces.
Sitka spruce	4,545	9,000	British Columbia.
Eastern hemlock	846	1,675	Eastern Provinces.
Western hemlock	16,685	33,040	British Columbia.
Douglas fir	17,963	35,570	British Columbia.
Western red cedar	17,210	34,060	British Columbia.
Poplar	578	1,155	Eastern Provinces.
White birch	3,171	6,280	Eastern Provinces.
Yellow birch	5,020	9,940	Eastern Provinces.
White elm }	190	375	Eastern Provinces.
Rock elm }			
Sugar maple	1,497	2,965	Eastern Provinces.
Basswood	227	450	Eastern Provinces.

CANADIAN EXPORT TIMBERS

AVERAGE ANNUAL SAWN LUMBER PRODUCTION BY SPECIES,
CALENDAR YEARS 1926-1930

	Thousand Standards	Thousand feet B.M.
SOFTWOODS:		
Douglas fir	718	1,421,543
Spruce, white, red and black	461	912,253
" Englemann	155	306,000
" Sitka	6	12,520
Pine, eastern white	225	445,680
" western white	13	25,699
" red	52	102,596
" jack	52	102,400
" lodgepole	8	14,900
" ponderosa	19	38,130
Hemlock, eastern	58	115,378
" western	126	249,608
Cedar, eastern white	7	14,112
" western red	72	142,457
Balsam fir, eastern	29	57,971
" " British Columbia	13	26,579
Larch, western	16	32,078
Tamarack	1	1,484
Total softwoods	2,031	4,021,388
HARDWOODS:		
Birch, yellow	48	95,311
" white	9	17,200
Maple	29	57,847
Basswood	11	22,517
Elm	10	19,403
Poplar	7	13,017
Beech	5	9,630
Ash	3	6,252
Oak	2	3,414
Other hardwoods	2	3,896
Total hardwoods	126	248,487
Total softwood and hardwood	2,157	4,269,875

CANADIAN EXPORT TIMBERS

SOFTWOODS

WHITE PINE (*Pinus Strobus*)

WHITE pine in Canada is sometimes called Eastern white pine, and in the United Kingdom, Quebec yellow pine and Ottawa pine. This tree, under favorable conditions, reaches a height of from 175 to 200 feet and a diameter of 5 feet, but in the average forest it is generally from 90 to 125 feet in height and from 20 to 30 inches in diameter, breast height.

It is found in Newfoundland and in Eastern Canada from the Maritime Provinces to Eastern Manitoba, but the commercial forests are largely confined to the St. Lawrence drainage area. Its best development is found in the Ottawa Valley of Ontario and Quebec and in the Great Lakes region of Ontario.

White pine was for many years the most important sawn lumber tree of Canada, and though its production is now exceeded by that of Douglas fir and spruce, it is still Canada's third most important timber from a production standpoint. The timber is very highly regarded for a wide variety of uses, and in particular for many special uses of an exacting nature. Its sapwood is almost white and the heartwood of a creamy white to a light straw-brown shade.

It is the softest of the Canadian pines and works exceptionally well under tools, taking a smooth satin-like finish. It is quite a light wood, in the air-dry condition weighing about 24 lbs. per cubic foot. It is not as strong as most of the hard pines and therefore is not used for heavy structural work, but for ordinary construction, where long life is of greater importance than high strength, it is very serviceable.

A most important characteristic of white pine is its low shrinkage. In this respect it is superior to all other Canadian species excepting the cedars. It seasons easily and uniformly, though care has to be exercised to prevent staining, especially of the sapwood. On account of its low shrinkage and uniform texture it is used extensively for patterns, windows, and for other uses where stability of size is important. The wood is comparatively free from injurious resin and takes stains, paints and varnishes exceptionally well. It has good nail-holding properties and does not split or splinter. White pine makes excellent wood flour, which is used extensively in the manufacture of linoleum.

CANADIAN EXPORT TIMBERS

TYPICAL USES:

General carpentry	Refrigerators
Agricultural implements	Laundry appliances
Musical instruments	Woodenware
House construction	Dairy appliances
Boarding	Furniture
Joinery	Shipbuilding and boat building
Windows and doors	Patterns, drawing boards and artists' supplies
Pumps, tanks and silos	Textile machinery
Vehicles	Flour-mill machinery
Boxes and crates	Shelving
Engineering works	Wood flour
Match splints	Wood wool
Mouldings	
Cabinet work	

White pine is exported as deals, boards, sidings, deal ends, and also as waney and square timber.

Deals are 2 to 4 inches in thickness (generally 3 inches), from 4 inches to 12 inches or over in width and up to 16 feet in length. They are shipped in four qualities: first, second, third and fourth.

Sidings are 1, $1\frac{1}{4}$, $1\frac{1}{2}$ and 2 inches thick, 7 inches and wider, and from 10 to 16 feet long, in first to fourth quality. Several special grades are put up by exporting firms to meet specific requirements of customers.

Deal ends are put up in first, second, third, and fourth qualities, 6 to 8 feet in length.

Deal buttings are usually put up in first, second, and third qualities, 2 feet to 5 feet in length.

Waney and square timbers are exported for re-sawing for special purposes.



(1) White Pine patterns. (2) White Pine under covered storage in Great Britain.



(1) White Pine is excellent for outside service. It is durable and holds paint well. Note White Pine siding and columns. (2) This barn has White Pine siding and Cedar shingle roof. (3) White Pine is an excellent wood for exposed work and finds considerable use in remodelling old houses. (4) The Royal York Hotel, Toronto, Canada. The window sash and frames are all of White Pine. (5) White Pine is used extensively for exterior doors and doorways on account of its very low shrinkage and high durability. (6) White Pine is favoured for trellis work and lawn furniture.



(1) White Pine turnery and hand carving combined with Yellow Birch in a coat rack. (2) Knotty White Pine panelling, clear White Pine trim, and hand carved decorative woodwork. (3) White Pine used for interior woodwork of a large theatre in Montreal. (4) White Pine and Yellow Birch in a ticket office in a theatre entrance. (5) White Pine and Yellow Birch combined to make an attractive staircase in a high-class home.

CANADIAN EXPORT TIMBERS

WESTERN WHITE PINE (*Pinus monticola*)

Western white pine is a tall tree with a clean bole tapering very little. It occasionally reaches a diameter of 4 feet and a height of 175 feet, but generally in an average forest it is from 75 to 125 feet in height and from 2 to 3 feet in diameter. In Canada it is found only in southern British Columbia and is generally mixed with western hemlock, Douglas fir and the true firs. It is found in some of the valleys of the interior where there is good rainfall, and on Vancouver Island and the adjacent mainland.

The wood of western white pine is closely similar to that of eastern white pine. It is very light in colour, though generally the heartwood is slightly darker than in the eastern wood. It is straight-grained and uniform in texture, slightly harder than eastern white pine but works well under tools. It takes an excellent finish, is very suitable for painting or enamelling, holds nails well, and is a most useful wood for a wide variety of purposes.

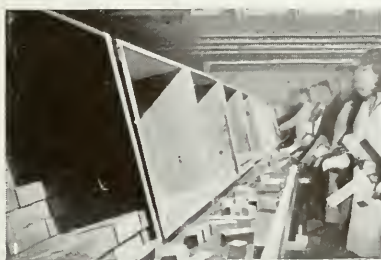
It is slightly stronger than eastern white pine, comparing very closely with spruce in this respect. It is fairly durable, though generally not rated so high in this respect as the eastern white pine. Air-dry, it weighs about 26 lbs. per cubic foot.

It seasons in the open with very little checking or warping and can be kiln-dried with little difficulty. In drying the shrinkage is medium, being between that of spruce and eastern white pine.

TYPICAL USES:

It is used for the same purposes as eastern white pine.

Western white pine is generally exported from British Columbia as deals or flitches, or as waney logs for re-sawing for pattern stock or other special purposes where wide clear material is required.



(1) Sorting and packing Western White Pine match blocks for export. (2) Western White Pine.



(1) Waney Western White Pine logs for export from British Columbia. (2) Door and doorway of Western White Pine—Western Red Cedar bevel siding. (3) Wide Western White Pine deals. (4) Western White Pine mantel. (5) Hall rack of Western White Pine with back of Black Cottonwood plywood.

CANADIAN EXPORT TIMBERS

RED PINE (*Pinus resinosa*)

This tree is frequently called Norway pine in Canada, but the name "red pine" is very significant and appropriate on account of the distinctive reddish-brown colour of the bark. Red pine is ordinarily from 75 to 120 feet in height, and attains a diameter of from 20 to 30 inches. The trunk is very erect with little taper and is usually clear of branches for about three-quarters of its length. Red pine is found from the Atlantic Ocean to Lake Winnipeg in Manitoba, but like white pine it is not found in large quantities north of the St. Lawrence drainage.

Red pine has a deep sapwood of a pale yellow colour; the heartwood is darker and of a pale reddish tinge. There is good contrast in colour between springwood and summerwood, especially in the heartwood, which gives the wood considerable figure when cut flat-grained. Although a comparatively light wood, it is heavier and harder than white pine, easy to work, takes a good finish, and holds nails and screws well. It is fairly strong, and is used extensively as a structural timber. It weighs about 28 lbs. per cubic foot, air-dry. For ordinary purposes it has medium durability, though untreated it is not very durable when in contact with the soil or in other conditions of severe exposure to decay.

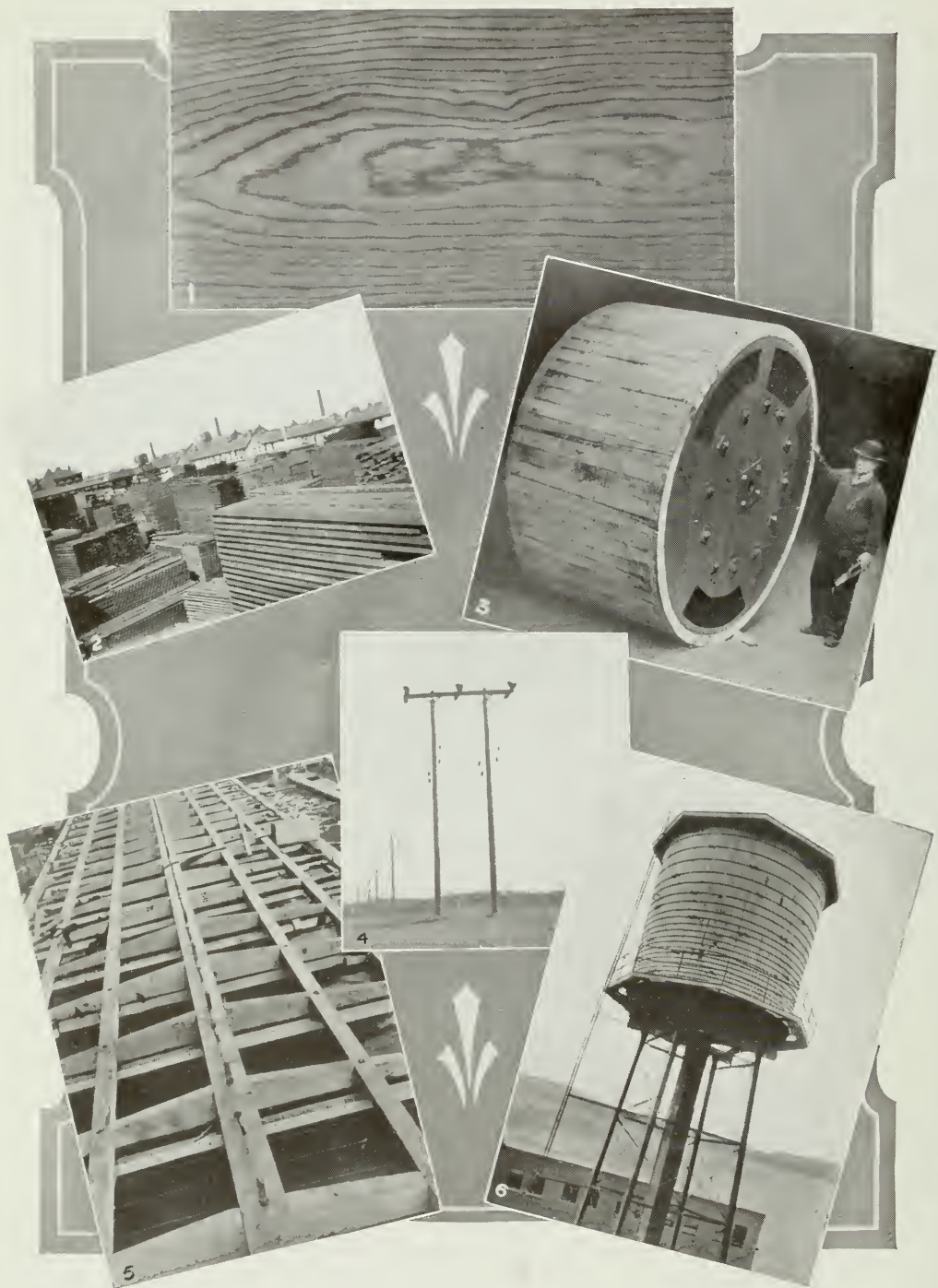
It seasons uniformly with little checking, twisting or cupping. It is readily kiln-dried and its finishing qualities improved thereby, through the setting of the resin. It shrinks in seasoning more than white pine, but may be classed among the woods having medium shrinkage. It can be quite readily treated with preservatives, especially the sapwood, and when so treated is especially valuable for poles and piles.

Red pine is exported as deals and boards. Deals are usually 2 inches and 3 inches in thickness, 4 inches and up in width and up to 18 feet in length. Special thicknesses and widths are furnished when required.

TYPICAL USES:

Structural timbers: Docks, bridges, shipbuilding	Garden frames Grain milling equipment	Agricultural implements Boxes and crates
Windows and doors	Cabinet work	Tanks and silos
House construction	General carpentry	Piling, Telephone poles
Derricks, Joinery	Railway wagons	Machinery parts

Both deals and boards are usually exported as unsorted quality, but boards are also shipped as Clear and Clear-face Grade, which is high-class material.



(1) Red Pine. (2) Red Pine and White Pine in yard storage in England. (3) Red Pine electric cable drum. (4) Creosoted Red Pine poles and piles are used extensively in Canada. (5) Red Pine used in roofing and refrigerator cars. (6) Red Pine water tank.

CANADIAN EXPORT TIMBERS

JACK PINE (*Pinus Banksiana*)

Jack pine is not a large tree, though in favourable stands it may attain a height of 90 feet and a diameter of 2 feet or more. In general, however, commercial trees are from 10 to 20 inches in diameter and 60 to 70 feet in height. In open forests jack pine is very branchy, but in a pure or mixed dense forest it develops a straight clear trunk. Jack pine is found in Canada from Nova Scotia to the Rocky Mountains and northern Alberta, where it meets the lodgepole pine, which it closely resembles.

The wood is quite light in colour, though slightly darker than that of white pine. It is of medium hardness, in this respect being considerably harder than white pine and slightly harder than red pine (though in the latter case the difference is not great). The sapwood is not so deep as in red pine. Jack pine weighs about 31 lbs. per cubic foot, air-dry.

It works and finishes quite well. As the tree is small it produces only a small percentage of prime material, but a good grade of common timber useful for a variety of purposes. It holds nails well, and for this reason is a valuable box and crating lumber.

For exposed work it is moderately durable and has been used very extensively in Canada for railway sleepers, but for best service in such positions it should be treated. It treats quite readily with creosote or other preservatives and, when treated, is increasing in favour for telegraph and telephone poles for which it has shown very satisfactory strength.

Jack pine seasons without difficulty and has comparatively low shrinkage factors, approaching white pine in this respect. Its shrinkage in seasoning is also very uniform, and therefore no great difficulty is encountered through warping and twisting in drying.

TYPICAL USES:

General house construction	General carpentry
Construction timbers	Concrete form work
Piles	Window and door frames
Posts	Boxes and crates
Telephone poles	Tanks and silos
Railway sleepers	Pulp
Mining timbers	

Jack pine is available for export as poles, piles, railway sleepers, and in Merchantable Grade of sawn timber.



(1) Jack Pine is one of the most widely used timbers in Canada for railway sleepers, both treated and untreated. (2) Jack Pine is being used increasingly for small and medium size poles when creosoted. (3) Electric apparatus packed for shipping to Argentina. Jack Pine, Spruce, and Red Pine are used extensively for such boxes. (4) Railway sleepers, principally of Jack Pine, Birch, Maple and Beech, seasoning prior to preservative treatment in a Canadian plant.

CANADIAN EXPORT TIMBERS

CANADIAN SPRUCE

In Eastern Canada there are three species of spruce—white spruce (*Picea glauca*), black spruce (*Picea mariana*), and red spruce (*Picea rubra*). As a timber tree, spruce in volume of output is second only to Douglas fir, but when its use for pulp and paper is taken into consideration, spruce is Canada's most important wood.

Canadian spruce (white and black) extends across Canada from the Atlantic Coast to Alaska and north to the sub-Arctic zone. It occurs to some extent west of the Rocky Mountains in northern British Columbia but does not reach the Pacific Coast. Red spruce, however, is limited to Nova Scotia, New Brunswick and the eastern part of Quebec.

The wood of the white and black spruces is very light in colour. Red spruce, although also light, has a reddish tinge with more distinct summerwood, which results in more pronounced figure than in the other two spruces. However, the three spruces are so very similar in all their properties that no distinction is made in the timber trade.

Canadian spruce is comparatively soft, and weighs about 28 lbs. per cubic foot air-dry. It takes a smooth satiny finish, works well under tools, and takes enamels, paints and varnishes satisfactorily. The wood is of great value for the packing of foods such as butter, which are liable to wood tainting. The fact that it holds nails well and does not split in nailing also makes it valuable for many kinds of containers.

Spruce is a moderately strong wood and therefore is not used in the heavier forms of structural work, though it is used extensively for form-work, carcassing, house framing, and similar work. While not a very stiff wood, it is very resilient, and for this reason is favoured for scaffolding boards and planks. Spruce is not a particularly durable wood in conditions of exposure, but for ordinary construction purposes it gives good service.

Practically all spruce in Eastern Canada is air-seasoned. It seasons quite readily and uniformly without undue degrade through checking and twisting. With respect to softwoods, spruce may be considered of average shrinkage.

CANADIAN EXPORT TIMBERS

TYPICAL USES:

Light and medium construction
Windows and doors
Carcassing
Butter and cheese boxes
Box boards
Musical instruments
Shop fitting
Agricultural implements
Joinery
Paddles and oars
Pulp and paper
Rayon pulp, cellophane

Cooperage
Wagon boxes
Pumps, tanks and silos
Organ pipes
Laundry appliances
Piano sounding boards
Ladder stock
Kitchen cabinets
General carpentry
Concrete forms
Shelving

Spruce is mostly shipped in deals two and three inches in thickness, from 4 inches to 11 inches in width and from 10 feet up in length. First, second and third qualities are generally shipped in a grade known as Merchantable. Sometimes orders are placed for unsorted material which includes Fourths. This is often regraded by the consignee to meet different trade requirements.

Short deals known in the trade as Deal Ends 3 feet to 9 feet in length are put up for special purposes.

Spruce can be supplied in nearly all dimensions up to a width of 11 inches and a length of 16 feet.



(1) Canadian newsprint from Spruce and Balsam Fir ready for export. (2) Canadian Spruce flooring after 25 years' service in a warehouse in Dublin. (3) Spruce is one of the chief woods used for headings of apple barrels in Eastern Canada.



(1) 30,000,000 feet of logs, principally Spruce, on the Miramichi river, New Brunswick. (2) Raft of logs, principally Spruce, on the St. John river, New Brunswick. (3) Spruce and Balsam Fir pulpwood storage pile for Eastern Canada newsprint. (4) Large quantities of Canadian Spruce are used in scaffolding and for concrete forms. It is especially preferred for scaffold planks. (5) Loading Spruce and Balsam Fir logs in the Maritimes. (6) Spruce is used extensively for scaffolding in erection and launching in the ship yards of Eastern Canada. This picture was taken in Halifax, Nova Scotia. (7) Canadian Spruce is a favourite wood for the manufacture of organ pipes. (8) Canadian butter is shipped in Spruce boxes.

CANADIAN EXPORT TIMBERS

SITKA SPRUCE (*Picea sitchensis*)

Sitka spruce is sometimes known as silver spruce.

It is a very large tree, occasionally attaining a diameter of over 10 feet and a height of 200 feet. It ordinarily runs from 3 to 6 feet in diameter and 100 to 150 feet in height. It occurs through the coastal belt of British Columbia and attains its best growth on the Queen Charlotte Islands.

Sitka spruce timber is light in weight (about 27 lbs. per cubic foot, air-dry). It is not as light in colour as some of the other Canadian spruces but is usually creamy white to a light pinkish tinge. There is very little difference in colour between the heartwood and sapwood, though generally the latter has not the pinkish shade. The wood is usually very straight-grained. While there is considerable difference in colour between springwood and summerwood, the contrast is not striking as in Douglas fir.

The wood is easily worked and takes a smooth silvery finish. It takes nails without splitting and holds them well, does not splinter nor check unduly in seasoning and working, takes paints and enamels well, and has excellent gluing properties. On account of the great size of the tree and its clear trunk it produces a high percentage of prime timber. The wood is practically tasteless and odourless.

Sitka spruce is among the strongest of the Canadian spruces. Being a large tree, it is capable of producing large flitches clear of knots or other defects suitable for the manufacture of aeroplane wing-beams, struts, posts, etc. In proportion to its weight it is very strong—a factor of great importance also in aeroplane construction. The wood does not splinter nor shatter easily with impact. Like that of all the spruces, it is only moderately durable. The early difficulty encountered through stain and mould in sending green spruce in vessels through hot zones has been overcome by seasoning for from 30 to 60 days before shipment. Sitka spruce is not difficult to season especially in boards or small sizes, but care must be exercised in seasoning valuable prime-quality stock in large flitches. Sitka spruce can be kiln-dried without undue difficulty. Its shrinkage in drying is medium and similar to that of other spruce.

CANADIAN EXPORT TIMBERS

TYPICAL USES:

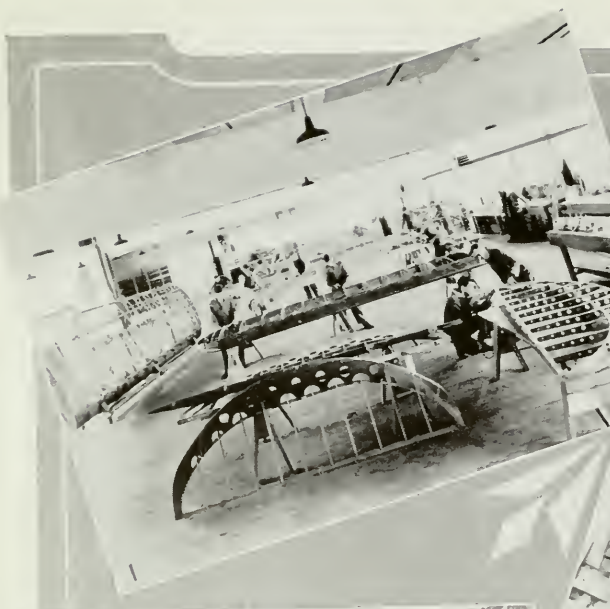
Masts and spars
Aeroplane construction
Woodenware
Pulp and paper
Butter boxes
Crates and containers
Sounding boards for musical
instruments
Organ pipes
Draining boards

Table tops
Kitchen cabinets
Oars and paddles
General carpentry
House construction
Agricultural implements
Ladders
Shelving
General joinery
Cooperage

Spruce is sometimes shipped as finished lumber, but generally it is exported in flitches of all sizes. Lengths run as high as 40 feet, widths up to 30 inches. Export sizes commonly are from 2 to 4 inches thick, 8 to 12 inches wide, and 10 to 40 feet long. The following grades are ordinarily shipped: Aeroplane grade; No. 2 Clear and Better or Prime; No. 3 Clear; Merchantable. Special grades are shipped to markets requiring a particular kind of stock.



(1) Berry crate, Sitka Spruce. (2) New Zealand butter box, Sitka Spruce.



(1) Sitka Spruce is one of the most important woods in the construction of aeroplanes. It is used for wing beams and inter-plane struts, posts and small parts. (2) Clear Sitka Spruce aeroplane grade timbers. (3) A typical large Sitka Spruce tree. (4) Sitka Spruce is valued for ladder stock and, with Western White Pine and other British Columbia softwoods is used in the toy industry.

CANADIAN EXPORT TIMBERS

EASTERN HEMLOCK (*Tsuga canadensis*)

Eastern hemlock is not a large tree, generally averaging from $1\frac{1}{2}$ to 2 feet in diameter and from 50 to 70 feet in height, though occasionally larger trees are found. The trunk is usually straight and in dense stands fairly free of branches. It is found from Nova Scotia westerly to Lake Superior south of the height of land, generally mixed with pine or hardwoods.

The wood is light buff in colour with a reddish brown tinge. The annual rings are quite distinct. It weighs about 29 lbs. per cubic foot, air-dry. It is inclined to be somewhat splintery and cross-grained, and while used to some extent finished, is more often used for rough construction work. The wood is of moderate strength not differing greatly from spruce; but is inclined to be more brittle than spruce. It is moderately durable in exposed situations, and is used in Canada to a considerable extent for bridge planking and railway sleepers, though its service for such purposes is greatly improved by treatment.

It is rather difficult to season on account of its tendency to twist, especially when spiral-grained. Its shrinkage in seasoning is moderate, corresponding closely to that of white spruce.

TYPICAL USES:

General carpentry
Bridge planks
Framing
Railway sleepers

Scantlings
Boarding
Sub-flooring
Structural timbers

Concrete forms
Sheathing and carcassing
Joists
Box and crate stock

While eastern hemlock is not considered a very important export timber, a certain amount is marketed abroad.



Eastern hemlock

CANADIAN EXPORT TIMBERS

WESTERN HEMLOCK (*Tsuga heterophylla*)

Western hemlock is sometimes called British Columbia hemlock.

It is one of the most important woods growing in British Columbia. Either as a tree or when cut into timber it has little similarity to eastern hemlock. The western hemlock is a large tree frequently attaining a height of from 125 to 150 feet and a diameter of from 3 to 4 feet, though generally it is from 20 to 30 inches in diameter. The trunk is generally straight and clear of branches for about three-quarters of its length.

Western hemlock is found from Alaska southward along the whole British Columbia coast. It is also found in the interior of British Columbia in certain areas where there is abundant rainfall. On the coast it occurs with Douglas fir, Sitka spruce and western red cedar, and with cedar, Engelmann spruce and the true firs in the interior of the province.

As a rule western hemlock is fine-textured and uniform. The wood is generally fairly light in colour though not as light as spruce. Sometimes it has a pinkish to reddish-brown tinge. There is little difference in colour between the sapwood and heartwood. The wood is normally free of resin—a factor of importance in its use for pulp and paper, certain kinds of boxes, and in its finishing qualities. Western hemlock is among the heavier Canadian softwoods, its weight being about 30 lbs. per cubic foot, air-dry. The wood, although not so hard as Douglas fir, is considerably harder than spruce and makes a good flooring material.

It takes a beautiful finish. The grain, though not so pronounced as that of Douglas fir, is quite distinctive, and the wood is highly regarded for interior joinery and decoration.

Although not as strong as Douglas fir, western hemlock ranks high in strength properties and can be used for many of the purposes to which Douglas fir is put. It is of the same order of strength as red pine and jack pine.

Western hemlock cannot be ranked among the most durable woods, especially in exposed situations favouring fungus attack. For ordinary purposes it is comparable with spruce in durability.

Western hemlock when green has a very high moisture content and does not season so rapidly nor so easily as Douglas fir. However, with a little care it can be seasoned very satisfactorily in the open air or in dry kilns. It shrinks considerably in seasoning, but holds its shape quite well after being properly seasoned.

CANADIAN EXPORT TIMBERS

TYPICAL USES:

House and general construction	Railway sleepers (treated)
Interior finishings	Cooperage
Panel work	Flooring
Exterior joinery	Underwater piling
Interior joinery	Pulp and paper
Boxes and crates	Form work
Windows and doors	Kitchen cabinets
Box shooks	Carpentry
Enamelled furniture	Broom handles
Ladder stock	Carcassing

Western hemlock is exported as box shook, as finished material such as flooring, ceiling, etc., as clear boards for panelling and interior joinery, and as merchantable quality in the usual dimension and structural sizes for general construction work.



- (1) Interior of small hall at the Friend's House, London, England, finished in Western Hemlock. (2) Western Hemlock panelling in home of prominent London architect. (3) Western Hemlock is one of the most important woods used in packing British Columbia apples.



(1) Kitchen cupboards of knotty Western Hemlock. (2) The new Shire block, Warwick, England. All interior joinery is of Western Hemlock. (3) Egg crate of Western Hemlock. (4) Western Hemlock. (5) A small gymnasium floor of Western Hemlock in New Westminster, British Columbia.

CANADIAN EXPORT TIMBERS

DOUGLAS FIR (*Pseudotsuga taxifolia*)

In the United Kingdom Douglas fir is very often called British Columbia pine. In some markets it is known as Oregon pine and Columbian pine but these names are rapidly being discontinued. It is the largest and the most important timber tree in Canada.

Douglas fir is found in British Columbia in all parts of the southern half of the province excepting the wet coastal district north of Vancouver Island, the mountain regions too high for its production, and certain parts of the Interior Dry Belt district. It is also found in southern Alberta on the east slope of the Rocky Mountains. The best forests in British Columbia are on Vancouver Island and the adjacent mainland.

Occasionally the tree reaches a diameter of 15 feet and a height of over 300 feet. In a good forest it frequently runs from 3 feet to 6 feet in diameter and from 150 feet to 200 feet in height. In such forests the trunk is clear of branches for about two-thirds or more of its height. It has very little taper and therefore produces a high percentage of timber clear of knots and other defects.

Douglas fir has a very thin sapwood, generally only $1\frac{1}{2}$ inches to 2 inches in depth. The sapwood is quite light in colour, but the heartwood ranges from a decided yellow tinge to a reddish brown, which gives rise to the terms "yellow fir" and "red fir," the difference in colour of the wood being generally attributable to age, rate of growth and other growth conditions.

There is a pronounced difference in colour between springwood and summerwood, which gives Douglas fir a very distinctive grain when sawn flat-grain or when rotary-cut for veneer.

With the exception of western larch, Douglas fir is the heaviest Canadian commercial softwood. It is, however, a comparatively light wood, weighing only about 37 lbs. per cubic foot in the air-dry condition. It is also among the hardest of the softwoods, and for that reason is used for purposes requiring hard and continuous wear.

Douglas fir is a very strong wood, especially in relation to its weight. In strength it is closely similar to American pitch pine though much lighter in weight, and in several of its strength properties is comparable with birch and oak. It has become one of the best-known timbers in the world market, not only for heavy structural purposes but for a wide variety of other uses.

Douglas fir ranks high in durability. It is not subject to staining or moulding in seasoning as it has a very thin sapwood. The tree is remarkably healthy and little decay is found in green lumber. The wood un-

CANADIAN EXPORT TIMBERS

treated gives good service for railway sleepers, piling, bridge timbers, culverts, etc., but for long service in conditions favouring decay it should be treated with creosote or other preservative, after incising to improve penetration. The sapwood treats quite readily. The heartwood is more refractory, but research has resulted in the development of processes which give excellent treatments without injuring the timber.

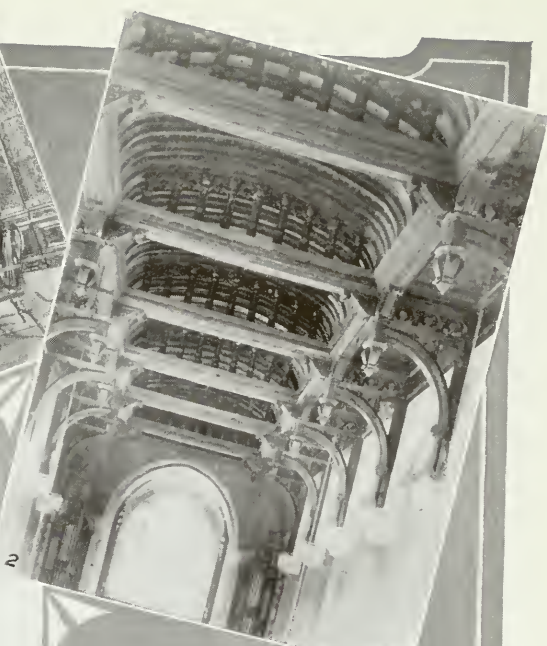
Douglas fir is an exceptionally easy timber to season either in the open air or in a dry kiln. Little trouble occurs with checking, twisting, or cupping. Clear timber can be dried in a kiln at quite high temperatures without injury; in the common grades less severe schedules should be used in order to prevent checking or loosening of the knots, but the kiln-drying of common lumber is now fairly common practice. Douglas fir shrinks considerably in drying, but, once properly seasoned, does not change in size unduly with variations in humidity.

TYPICAL USES:

Heavy structural timbers	Barges
Dock and harbour works	Carpentry
Piling	Shipbuilding
Railway wagons	Flooring and flooring blocks
Sheathing and carcassing	Windows and doors
Slack and tight cooperage	Tanks and silos
Paving blocks	Motor car and truck bodies
Masts and spars	Agricultural implements
Telephone poles (treated)	Mine timbers
Veneers and plywood	Concrete form work
Joinery, interior and exterior	Railway sleepers
Ladders	

Douglas fir is exported as finished timber and as rough timber from 1 inch boards to large square timbers. It is exported in small squares 4 inches by 4 inches, and in very large and long squares up to 30 inches for special work as in wharf construction. It is also exported in large flitches and in half-timbers. In the best quality lengths can be secured up to 32 feet, while in merchantable grades they may run as high as 80 feet or over. The grades exported are generally No. 2 Clear and Better, or Prime, Select Merchantable and Merchantable, but several other special grades, including the so-called UKAY and Common grades are shipped.

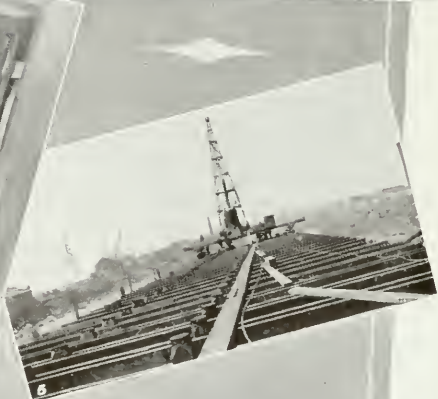
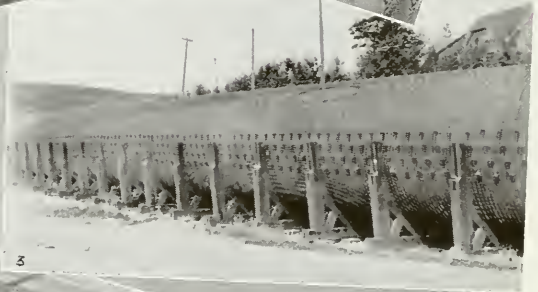
An important development is the increase in the use in the United Kingdom of British Columbia standard sizes for carcassing. This stock is surfaced four sides or planed on one side and one edge, to finish $\frac{1}{4}$ -inch less than the nominal dimensions.



(1) Doors and panelling of Douglas Fir. (2) Douglas Fir ceiling in the chapel of Christ's Hospital School at Horsham, England. (3) Flats erected by the London County Council at Clapham Park Estate. Doors, windows, roofing timbers, carcassing are of Douglas Fir. (4) Part of Liverpool Corporation Housing Project of 246 tenements. Douglas Fir (scant size) used throughout for carcassing. (5) Addition to County Hall, Westminster Bridge, London. Douglas Fir was used for a great deal of the joinery.



(1) Unit piling of Western Red Cedar and Douglas Fir for loading by travelling crane. (2) Passenger and freight sheds 1,800 feet long by 150 feet wide recently constructed by the Southern Railway in connection with dock extension at Southampton, England, in which roof and roofing boards are of British Columbia Douglas Fir. (3) Douglas Fir barrels for shipment to Great Britain from British Columbia. (4) Douglas Fir timbers used in the construction of the Welland Ship Canal. (5) Douglas Fir lining and decking in a steel-framed freight car. (6) Floor of storage tank twenty-five feet in diameter made from Douglas Fir, $3\frac{1}{2}$ inches by 12 inches. No splicing permitted in any piece.



(1) Highway bridge over the Fraser river, Quesnel, British Columbia. Timbers of creosoted Douglas Fir framed before treatment. (2) Douglas Fir door. (3) Creosoted wood stave water pipe of Douglas Fir installed at a northern Quebec pulp mill. (4) Douglas Fir plywood used in the cabins of the S.S. Duchess of Bedford. (5) Photograph showing use of Douglas Fir in the construction of the new dock on the Antrim side of Belfast harbour. (6) Creosoted Douglas Fir piling for wharf construction.

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WESTERN RED CEDAR (*Thuja plicata*)

Western red cedar is the largest of the cedars native to North America, occasionally attaining a diameter of 15 feet or over and a height of 200 feet. In the forest it is generally from 3 to 8 feet in diameter and from 125 to 175 feet in height. The trunk tapers rapidly. It is found throughout the coastal district of British Columbia and in some of the valleys of the Interior district where the precipitation is high, but it reaches its best development on Vancouver Island and the adjacent mainland.

It has a very thin sapwood which is of a light yellow tinge. The heartwood varies considerably in colour from a pinkish red to a deep warm brown, the latter shade being generally associated with old trees. The wood is straight-grained and splits readily and uniformly. It is quite soft and light, weighing only about 22 lbs. per cubic foot when air-dried.

The wood has exceptionally good working qualities and takes a smooth satiny finish. It takes stains and paints well and has good gluing properties. It contains considerable oil but practically no resin.

It has very fair strength when used as a round pole, for which purpose it is used extensively; or when used in compression as in a post or column; but it is not suitable for beams with heavy loading.

Western red cedar is an extremely durable wood in contact with the soil or in positions favouring decay, and for that reason is used for siding, fence posts, telegraph poles, sills, piling, culverts, greenhouses, conduits and other similar purposes. It is particularly valuable, as shingles for roofing, for which purpose it is the most widely used wood in America.

Western red cedar seasons quite readily though it does not give up its moisture as quickly as Douglas fir. It is one of the lowest woods in shrinkage, and this characteristic, combined with its resistance to changes in moisture content, causes it to retain its size and shape exceptionally well after being properly seasoned. This is a factor which has made this wood much favoured in canoe and boat construction.

TYPICAL USES:

Shingles
Porch work
Greenhouse construction
Conduits
Fence posts
Telegraph poles
Railway sleepers (when suitably
protected with plates under
rails)
Joinery
Lath

Cabinets
Panneling
Certain classes of doors
Clothes closets and chests
Pattern making
Pencil slats
Boats and canoes
Piling
Window sashes
Weather boarding or siding

CANADIAN EXPORT TIMBERS

It is exported as No. 2 Clear and Better or Prime and Common grades; also as shingles, the chief grade being called 5X which is 16 inches in length. Shingles are rift-sawn to prevent warp or curl. Western red cedar is available for export as telegraph and telephone poles.



(1) Western Red Cedar ceiling, Knox Church, Ottawa. (2) Western Red Cedar trees. (3) The dining room in the Canadian Bank of Commerce, Toronto, panelled with Western Red Cedar. (4) The music room of Hart House, University of Toronto. Western Red Cedar has been used with a very pleasing effect in this room.



(1) House at Weybridge, Surrey, with Western Red Cedar shingle roof. (2) Thatched roof effect obtained with specially prepared Western Red Cedar shingles. (3) Sawn Western Red Cedar for roof covering. (4) Western Red Cedar bevel siding, shingle roof. (5) A lodge at Lucerne, Quebec, built of Western Red Cedar logs from British Columbia. The roof is of Cedar shingles.

CANADIAN EXPORT TIMBERS

HARDWOODS

POPLARS

THERE are eight species of poplar native to Canada. Of these the more important are: (1) black cottonwood (*Populus trichocarpa*), a large tree found in the valleys along the Pacific Coast and in the rich bottom land along the rivers of interior British Columbia (this wood is used principally for veneers, soda pulp and match sticks); (2) balsam poplar (*Populus balsamifera*), and (3) aspen poplar (*Populus tremuloides*). The last-named is the most important species commercially.

ASPEN POPLAR (*Populus tremuloides*)

The aspen poplar is not a very large tree, being generally from 8 to 12 inches in diameter and 50 to 65 feet in height, but occasionally attaining a diameter of 24 inches and a height of 90 feet. It has a wide distribution, extending completely across Canada from the Atlantic to the mouth of the Mackenzie River and to Alaska. It usually occurs as a temporary type after fire and is often associated with white birch or with certain of the conifers such as pine, spruce and balsam.

The wood is quite light in colour and soft. It is also light in weight, about 28 lbs. per cubic foot, air-dry. It is not durable when exposed to conditions favouring decay, but for certain uses it is quite suitable, and on account of its abundance in Canada is attracting increasing attention.

Aspen poplar is rather difficult to season, being inclined to twist and warp unless carefully piled for drying. It works quite well and has good nail-holding properties.

TYPICAL USES:

Soda pulp	Wood-wool
Matches	Pails
Core-stock	Brush backs
Boxes	Novelties
Baskets	Veneers and plywood

It has not been exported as yet in large quantities, but round logs for matches as well as sawn lumber for boxes and core stock have been shipped.

CANADIAN EXPORT TIMBERS

YELLOW BIRCH (*Betula lutea*)

This species is sometimes called "red birch" and "black birch." It is found from the Maritime provinces westward to the east end of Lake Superior, also from the west end of this lake to the Lake of the Woods along the Canada-United States boundary. It is the most important commercial hardwood in Canada on account of its fine qualities and its abundance. It is the largest of the birches native to Canada, being sometimes 100 feet high with a diameter of from 2 to 3 feet. In the forest it is usually from 20 to 30 inches in diameter and from 60 to 80 feet in height, and has a long clear trunk with moderate taper.

The sapwood is of a light yellow colour and the heartwood a distinctive reddish brown. The wood is of uniform texture and, while the grain is not very pronounced, it produces lumber with a very pleasing, subdued figure. The wood may be ranked among the heavy hardwoods. It is almost identical with white oak in hardness and nearly as hard as maple. It is a little lighter in weight than oak and maple, and ranks with them as a hardwood capable of exacting uses and as a hard-wearing wide-utility wood. It weighs about 44 lbs. per cubic foot, air-dry.

Yellow birch takes a smooth finish, is quite easily worked under tools, and takes a good polish. It is increasing in popularity as a furniture wood and for high-class interior finish and decoration. Some logs produce curly-grained birch, which is much prized for furniture and for veneers of the rotary-cut type.

Yellow birch has high mechanical properties, in this respect again being very similar to white oak.

Yellow birch for ordinary purposes is quite durable, but should not be used in conditions favourable to decay without treatment. It can, however, be treated quite readily and uniformly, and is used, when so treated, quite extensively in Canada for railway sleepers.

The heavy hardwoods are generally considered difficult to season, but yellow birch seasons with very little difficulty either in the open air or in dry-kilns. In general, where kiln-dried material is required, the stock is first air-seasoned. The shrinkage in seasoning, as in white oak, is fairly high, but very uniform with respect to the radial and tangential direction so that there is little trouble with distortion or with subsequent "working."

CANADIAN EXPORT TIMBERS

TYPICAL USES:

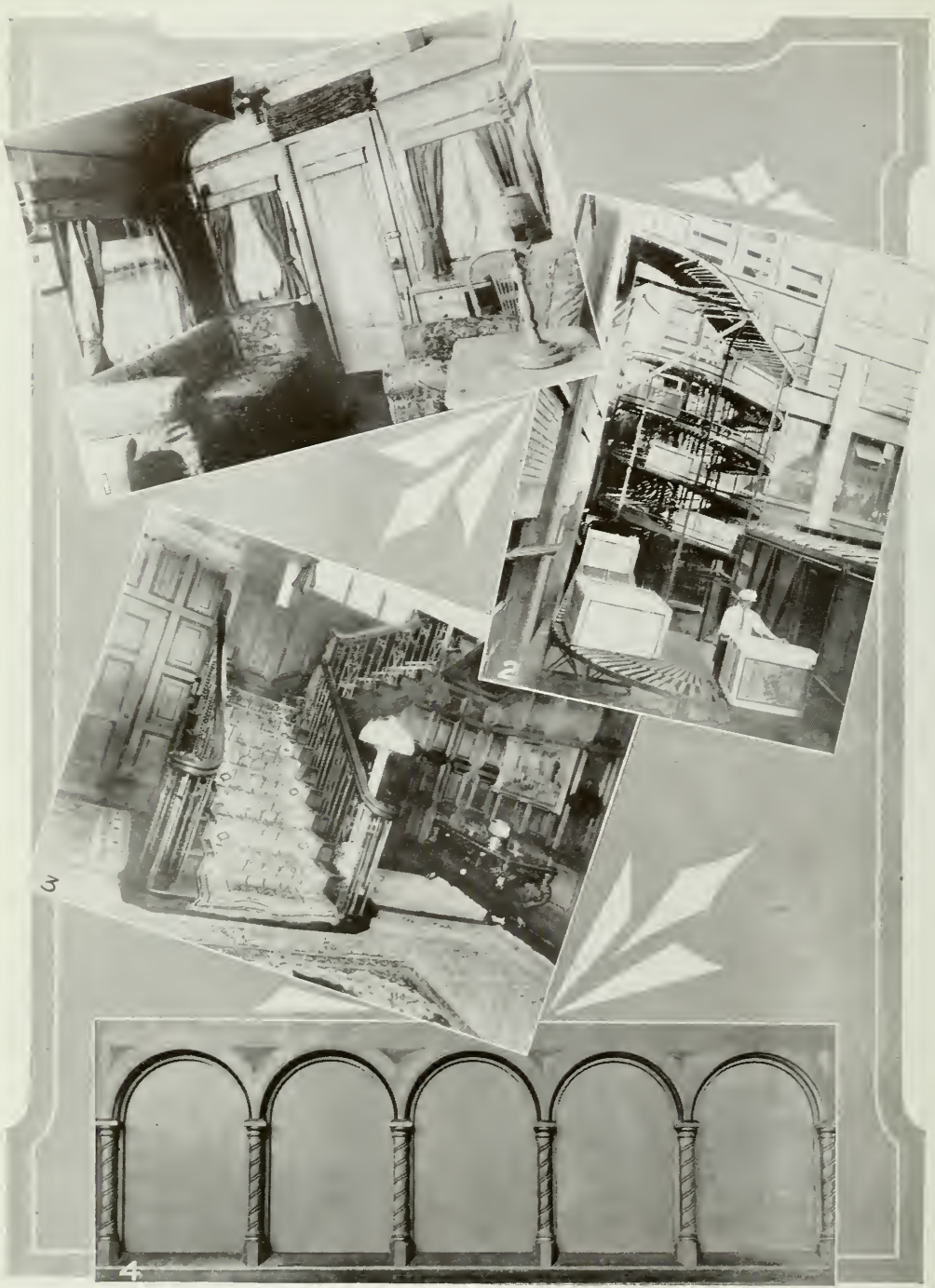
Flooring
Furniture
Flush doors
Interior finishing
Cabinet work
Motor car body frames
Brush backs
Rungs for ladders
Boxes and crates
Boot and shoe findings
Toys and sporting goods

Veneers and plywoods
Railway sleepers
Railway coach work
Turnery
Chairs
Woodenware
Tin-plate boxes
Shuttles, spools, bobbins
Parquetry
Joinery
Cooperage

Birch is exported generally in thicknesses from 1 inch to 4 inches, and in widths 4 inches and over; lengths 6 feet and up. Most of the birch exported is graded according to the National Hardwood Lumber Association rules, but for some markets it is graded as Prime, Select and Merchantable. It is also exported as round and hewn logs for veneer and other special purposes.



(1) Restaurant furniture of Yellow Birch. (2) Yellow Birch takes an attractive finish and is an excellent furniture wood. (3) Yellow Birch makes an attractive hard-wearing floor. (4) Breakfast room furniture of Yellow Birch.



(1) Interior of private railway carriage, finished in curly Yellow Birch. (2) Yellow Birch plywood for containers. (3) Yellow Birch makes attractive panelling and is used in homes of distinction. (4) A panel of treated Yellow Birch.



(1) Street car with interior finish of Yellow Birch. (2) Yellow Birch was used throughout for interior finishing in the Confederation Building of the Dominion Government, Ottawa. (3) Creosoted laminated Yellow Birch flooring for harbour construction, Saint. John, New Brunswick. (4) An interior view of the Y.W.C.A. Girls' Club, Kirkcaldy, Scotland, showing a room with Yellow Birch flooring. (5) Ball room floor of Yellow Birch, St. James Hotel, Torquay, England.

CANADIAN EXPORT TIMBERS

WHITE BIRCH (*Betula papyrifera*)

The name "white birch" is applied to several birches which have white bark, but the principal one is *Betula papyrifera*, often known as paper or canoe birch. White birch has a very wide range in Canada being found from the Maritime Provinces westward to the Yukon and nearly to the mouth of the Mackenzie River.

White birch is a comparatively small tree, rarely exceeding 70 feet, in height and 18 inches in diameter. Generally it is from 50 to 60 feet in height and from 10 to 14 inches in diameter and comparatively free of branches.

The wood is creamy-white in colour. Among the hardwoods it may be classed as of medium hardness and weight, in these two respects being below yellow birch, maple, oak, beech and the other heavy hardwoods, but higher than poplar, basswood, chestnut and other light hardwoods. It weighs about 40 lbs. per cubic foot, air-dry.

The wood works exceptionally well under tools and while not as strong as yellow birch, is quite a strong, tough, serviceable wood. It is not durable in exposed positions.

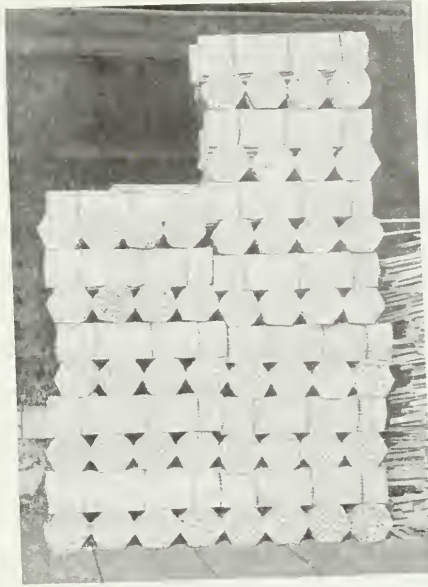
With care it seasons quite satisfactorily, its shrinkage being somewhat less than for the heavier hardwoods such as yellow birch, hard maple, and white oak.

TYPICAL USES:

Spools	Brushes
Bobbins	Hoops
Dowels	Novelties
Clothes pins	Washboards
Shoe pegs	Skewers
Shooks	Small handles
Woodenware	Crates
Kitchen utensils	Toys
Buckets	Crutches

For the export market white birch is generally shipped in the form of squares from 1 inch to $2\frac{1}{2}$ inches to the side and from 20 inches to 42 inches in length.

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White birch dowel-wood



White birch spoolwood seasoning for export to England

CANADIAN EXPORT TIMBERS

SUGAR MAPLE (*Acer saccharum*)

There are in Canada nine species of maple, but the sugar maple or, as it is frequently called, the hard maple, is the chief commercial species. It is quite a large tree, sometimes reaching a height of 125 feet and a diameter of 3 feet, but it is generally from 20 to 30 inches in diameter and from 80 to 90 feet in height, with a fairly clear trunk. Sugar maple is found from Nova Scotia to the Lake of the Woods south of the height of land between Hudson Bay and the Great Lakes. Its range in commercial size is, however, much more restricted. Next to yellow birch it is the most important commercial hardwood in Canada both from the standpoint of variety of uses and availability of supply.

The wood is light in colour with little difference between the heartwood and sapwood; it is of a creamy-white shade. Occasionally in the larger trees and on some sites a darker-brown heart develops. The annual rings are fairly well marked by a narrow brown line which gives the wood quite a pleasing figure when cut flat-grain. Sugar maple is the hardest and heaviest of the important Canadian commercial hardwoods, in these two respects exceeding yellow birch, though not greatly. Its weight in the air-dry condition is about 47 lbs. per cubic foot. It has splendid resonance properties.

For a wood of its hardness, maple works quite easily. It takes a fine smooth surface and a high polish. Maple turns exceptionally well. It has excellent gluing properties and holds nails and screws well, but on account of its hardness offers considerable difficulty in nailing. Maple is easy to stain and takes enamel and paints satisfactorily. Curly maple and bird's-eye maple are particularly prized for furniture.

Maple is a very strong, stiff wood, exceeding white oak in these respects. It is therefore used extensively in frame and body work. When treated with preservatives it is used in Canada for railway sleepers. Untreated maple is not considered a very durable wood in exposed situations favouring decay. It offers considerable resistance to penetration by creosote, but by incising before treatment a very satisfactory penetration can be obtained.

Although maple seasons slowly, with proper care it can be dried in the open or in dry-kilns without undue difficulty. Its shrinkage is fairly high and is closely similar to that of yellow birch. For many purposes maple and birch are used in Canada without differentiation.

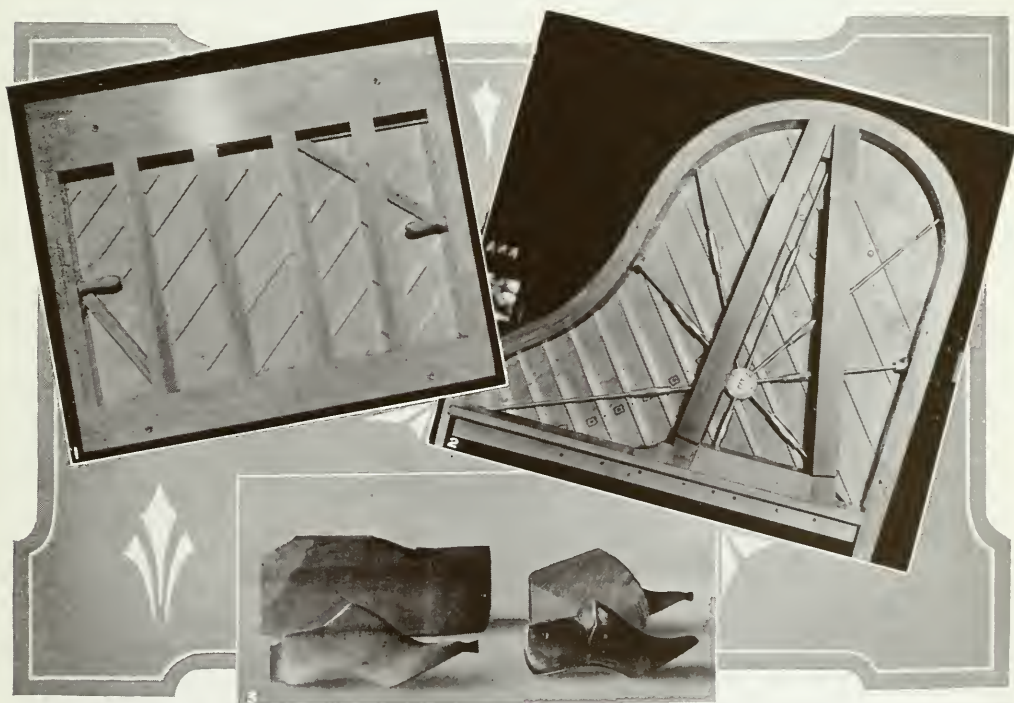
CANADIAN EXPORT TIMBERS

TYPICAL USES:

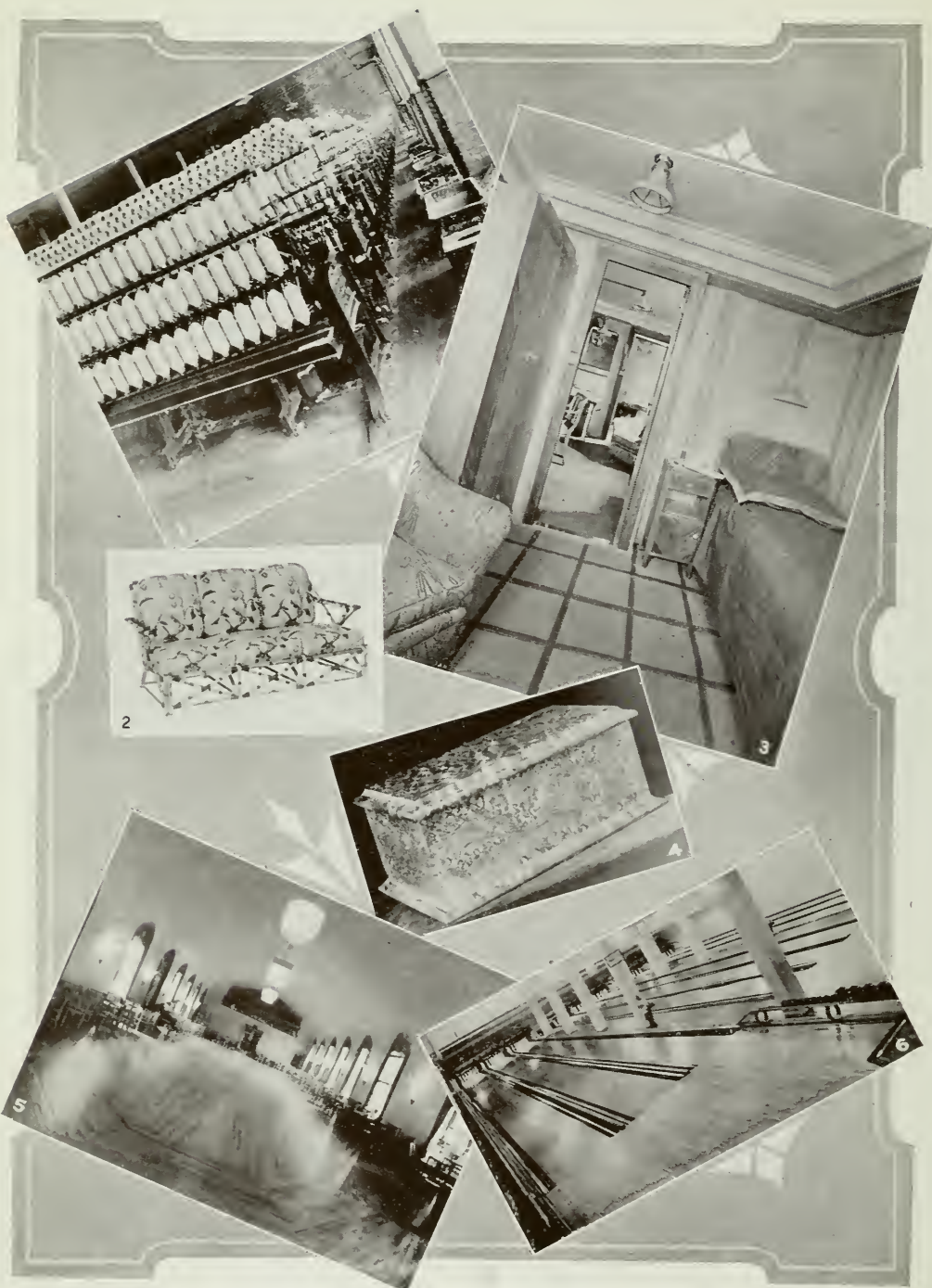
Flooring (house, warehouse,
public buildings)
Interior finishing
Panels
Furniture
Piano actions
Printing and press rolls
Shoe findings
Agricultural implements
Turnery

Musical instruments
Sporting goods
Butcher blocks
Bowling alleys
Railway sleepers
Dairy and laundry appliances
Railway coach work
Electrical apparatus
Cabinet making
Mangle rolls

Maple is shipped in rough and finished flooring strips generally 1 inch by 4 inches; also in strips 1 inch and $1\frac{1}{4}$ inches thick, 3 inches and wider for the manufacture of flooring blocks. A good deal of maple is shipped in thicknesses of from 1 inch to 4 inches, widths 4 inches and up, and lengths 6 feet and over. It is generally graded according to the Rules of the National Hardwood Lumber Association, or in some cases to special grades established by usage for particular markets or purposes.



(1) Piano frame of Maple, sounding board of Spruce. (2) Maple is used in the laminated frame and in the cross bracing of this grand piano; Spruce in the sounding board. (3) Maple is used for shoe findings.



(1) Bobbins of Maple in a textile plant. (2) The framework is of Maple in the round. (3) Maple panelling in a first-class cabin of the S.S. Empress of Britain. (4) Box of Bird's-eye Maple. (5) Maple flooring in the ballroom, Clifton Zoological Gardens, Bristol, England. (6) Maple used for bowling alleys and bowling pins.

CANADIAN EXPORT TIMBERS

BASSWOOD (*Tilia glabra*)

Basswood is one of the most widely useful woods among the softer hardwood species. It is found in Canada from the Atlantic Coast westward to southern Manitoba. Ordinarily it is from 60 to 70 feet high and from 15 to 30 inches in diameter, but sometimes reaches a height of over 100 feet and a diameter of 4 feet.

The wood is light in colour, shading from a creamy white to a very light brown. In weight and hardness it is slightly higher than white pine and very nearly the same as red pine. It weighs about 29 lbs. per cubic foot, air-dry.

It works exceptionally well under tools and is quite a favorite wood for hand-carving and modelling. It takes a smooth finish, takes and holds paints and lacquers in an excellent manner, and has good gluing and nail-holding properties. It has practically no taste or odour and is therefore used for containers for foodstuffs.

Basswood is not a strong wood in comparison with the heavier hardwoods such as birch or maple, but is more nearly similar to the lighter pines in strength.

It is not a durable wood when exposed to conditions favouring decay.

It seasons quite readily without undue difficulty with respect to checking and twisting, has high shrinkage factors, but after proper seasoning does not "work" unduly.

TYPICAL USES:

Piano keys	Patterns and models
Turnery	Wood wool
Baskets	Beekeeper's supplies
Woodenware	Picture frames
Wood specialties	Musical instruments
Hand carving	Barrel headings
Boxes and crates	Cigar boxes
Cupboards	Drawing boards
Blinds	Handicraft work
Veneers	Enamelled work
Toys and games	

While exported to some extent, the quantities are not large. Demands are mostly for piano key stock usually from 1 inch to 2½ inches in thickness, from 6 inches to 16 inches in width, and from 6 feet to 18 feet in length. There is a certain demand for round basswood logs for cut-up purposes.



(1) A Basswood tree. (2) Kitchen table top in centre, and other typical uses for Basswood.
 (3) Basswood logs being loaded at Montreal for shipment to the United Kingdom.

CANADIAN EXPORT TIMBERS

WHITE ELM (*Ulmus americana*)

The white elm is one of the largest hardwood trees found in Canada, occasionally attaining a diameter of over 5 feet and a height of 100 feet. In the forest it is from 2 to 3 feet in diameter and from 70 to 90 feet in height, with a long clear trunk. It is found in all provinces of Eastern Canada.

The sapwood is quite light in colour, but the heartwood is a light reddish-brown. It is considerably lighter in weight and softer than yellow birch, white oak and sugar maple, but in these respects superior to the softer hardwoods such as basswood and poplar. It weighs about 42 lbs. per cubic foot, air-dry.

It works fairly well under tools and takes a good finish.

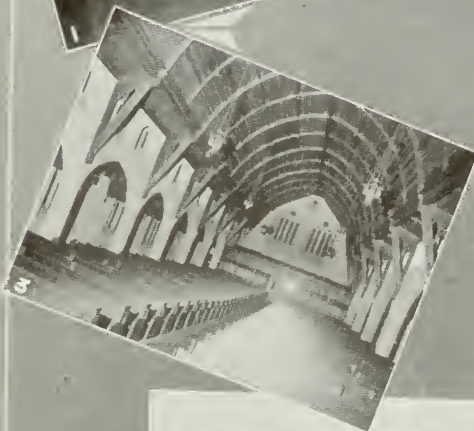
While not as stiff as the heavy hardwoods, it is quite a strong wood and is especially prized for its toughness and good bending properties. It is therefore used for hoops, baskets, barrel staves, etc., which have to be bent to shape. It is fairly durable.

White elm seasons quite easily and is of moderate shrinkage.

TYPICAL USES:

Slack cooperage	Barrel staves
Crating and boxes	Agricultural implements
Cheese boxes	Carriage hubs
Hockey sticks	Machinery parts
Trunks	Hoops
Coffins and caskets	Pails
Handles	Church pews
Baskets	Furniture
Ladders	Veneers
Chairs	Woodenware

White elm is not exported in large quantities, and when exported it is generally for the manufacture of coffins, which require 1-inch timber of good width.



(1) Elm veneer is used for cheese boxes. (2) White Elm tree. (3) Elm church pews. Western Red Cedar beamed ceiling. (4) Elm is favoured for apple barrel staves and hoops; considerable spruce is also used for staves and headings.

CANADIAN EXPORT TIMBERS

ROCK ELM (*Ulmus racemosa*)

Rock elm is sometimes called "cork elm." It is not a large tree, being only about 2 feet in diameter and from 50 to 60 feet in height. In Canada it is confined to the southern parts of the provinces of Quebec and Ontario.

In colour it is somewhat similar to the wood of white elm, but the contrast between heartwood and sapwood is not so pronounced. It is a hard and heavy wood, exceeding considerably other Canadian elms and white oak in this respect. Its weight is about 49 lbs. per cubic foot, air-dry.

It is rather a difficult wood to work but finishes to a fairly smooth surface. It holds nails exceptionally well, takes a good polish, and holds stains and paint very satisfactorily.

Rock elm is a very strong, tough wood, and is used as a specialty wood where strength and hard wear are required. It is also very durable and is used for dock and wharf construction in places which come in contact with vessels. It is used also for ship's belting.

Care has to be exercised in seasoning this wood, as it is inclined to check and twist. It shrinks considerably in drying.

TYPICAL USES:

Agricultural implements	Whiffle trees
Framework for furniture	Machine handles
Rockers	Rubbing strips for wharfs, etc.
Gymnasium equipment	Boat construction
Motor car bodies	Fenders
Motor buses	Bentwork
Double trees	Ship's belting

It is exported only in small quantities generally for special purposes, frequently as round logs and sometimes as hewn logs. These are generally from 20 to 40 feet in length with a diameter at the small end of 12 inches and up.

CANADIAN EXPORT TIMBERS

ADDITIONAL CANADIAN SPECIES OF DOMESTIC IMPORTANCE ONLY

In addition to the timbers which have been classified as export timbers and already described, there are in Canada quite a large number of timbers, both softwoods and hardwoods, which are of very considerable importance in Canada for domestic use or for export to the United States market. Some of these occur in large quantities, but on account of their distance from ports, entailing heavy rail haulage charges, they cannot be exported. In other cases the home market consumes the full available quantities. In a few cases the timbers omitted from the export list are available in large quantities to seaports, but export trade in them has not yet been developed to any extent. No sharp line can be drawn between them and some of the less important timbers included as export timbers.

In the following list some of the timbers which may eventually become of importance in the export market are indicated by an asterisk:

- Ponderosa pine: *Pinus ponderosa* Dougl.
- Lodgepole pine: *Pinus contorta* Dougl. var. *latifolia* Engelm.
- Tamarack: *Larix laricina* (Du Roi) Koch.
- *Western larch: *Larix occidentalis* Nutt.
- Engelmann spruce: *Picea Engelmanni* Engelm.
- Eastern white cedar: *Thuja occidentalis* L.
- *Balsam fir: *Abies balsamea* (L.) Mill.
- *Grand fir: *Abies grandis* Lindl.
- *Amabilis fir: *Abies amabilis* (Dougl.) Forbes.
- *Yellow cedar: *Chamaecyparis nootkatensis* (Lamb.) Spach.
- Butternut: *Juglans cinerea* L.
- Hickory: *Carya ovata* (Mill.) K. Koch, and *Carya cordiformis* (Wang.) K. Koch.
- Red alder: *Alnus rubra* Bong.
- Ironwood: *Ostrya virginiana* (Mill.) K. Koch.
- *Beech: *Fagus grandifolia* Ehrh.
- Chestnut: *Castanea dentata* (Marsh.) Borkh.
- White oak: *Quercus alba* L.
- Red oak: *Quercus borealis* Michx.
- Black cherry: *Prunus serotina* Ehrh.
- Broad-leaved maple: *Acer macrophyllum* Pursh.
- Silver maple: *Acer saccharinum* L.
- White ash: *Fraxinus americana* L.
- Black ash: *Fraxinus nigra* Marsh.
- *Black cottonwood: *Populus trichocarpa* Torr. & Gray.

MECHANICAL AND PHYSICAL PROPERTIES

No attempt has been made to enter into a detailed discussion of the mechanical and physical properties of the timbers described. However, the following table will serve to give, in concise form, data which will permit a comparison of the principal properties of the timbers dealt with. More details are available in technical publications of the Forest Products Laboratories of Canada, Forest Service, Department of the Interior.

SOME PROPERTIES OF CANADIAN EXPORT TIMBERS

In Air-Dry Condition (12 per cent approximately)

Species	Weight per cu. ft., in pounds	Static bending		Compression parallel	Compression perpendicular	Hardness	Shrinkage		
		Modulus of rupture, lb. per sq. in.	Modulus of elasticity 1,000 lb. per sq. in.				Volu- metric	Radial	Tan- gen- tial
SOFTWOODS:									
Pine, White	24	8,550	1,190	4,650	530	325	8.0	2.5	6.1
" Western White	26	9,200	1,520	5,550	500	415	11.6	4.0	7.3
" Red	28	10,100	1,400	5,360	740	470	10.0	3.9	6.8
" Jack	31	10,100	1,450	5,260	770	540	9.8	4.1	5.8
Spruce, Black									
" Red	30	10,300	1,520	5,850	620	515	11.6	3.9	7.2
" White	28	8,900	1,450	5,300	500	460	11.9	4.0	8.0
" Sitka	26	8,600	1,400	4,980	490	420	10.8	3.5	6.4
"	27	10,400	1,720	5,500	650	535	11.7	4.6	7.8
Hemlock, Eastern									
" Western	29	9,400	1,220	5,680	630	535	10.1	3.1	6.1
"	30	11,100	1,690	6,390	650	580	12.9	5.3	8.5
Douglas Fir	37	14,800	2,260	8,480	1,100	815	12.3	4.9	7.9
Cedar, Western Red	22	7,800	1,220	5,070	510	330	7.8	2.1	4.2
HARDWOODS:									
Poplar	28	9,900	1,540	5,270	450	485	11.6	3.3	6.7
Birch, Yellow	44	15,600	2,150	7,790	1,130	1,345	16.0	6.3	7.5
" White	40	13,700	1,910	6,570	900	970	14.4	5.5	7.6
Maple, Sugar	47	16,100	2,120	7,730	1,350	1,655	15.8	4.7	8.6
Basswood	29	8,700	1,400	4,920	370	495	18.4	6.7	9.3
Elm, White	42	12,900	1,610	5,970	1,020	1,255	15.2	4.2	7.2
" Rock	49	15,900	1,760	7,630	1,280	1,690	17.0	5.9	9.7

CANADIAN EXPORT TIMBERS

FOREST SERVICE PUBLICATIONS

Where more detailed information is desired with regard to a particular species or to a special problem connected with the use of Canadian woods, some of the following publications may be found to be of value.

Correspondence in connection therewith should be addressed to the Director of Forestry, Department of the Interior, Ottawa, excepting where noted.

Bulletin 61 "Native Trees of Canada."

Tree Pamphlets: (1) White pine; (2) White spruce; (3) Douglas fir; (4) Hemlock (Eastern); (5) Western Hemlock; (6) Red pine; (7) Jack pine; (8) Lodgepole pine; (9) Balsam fir; (10) Cedar (Eastern); (11) Western Cedar; (12) Sitka Spruce; (13) Western Yellow Pine; (14) Sugar Maple.

"The Forests of Canada."

"Softwood Resources of Canada."

Correspondence in regard to the following Forest Service publications should be addressed to the Superintendent, Forest Products Laboratories, Ottawa:

Bulletin 59 "Canadian Woods for Structural Timbers.

" 71 "Canadian Sitka Spruce: Its Mechanical and Physical Properties."

" 78 "Some Commercial Softwoods of British Columbia."

" 80 "British Columbia Softwoods; Their Decays and Natural Defects."

" 81 "Identification of Woods Commonly Used in Canada."

" 82 "The Mechanical Properties of Canadian Woods, together with their Related Physical Properties."

" 83 "Sawmill Waste and Its Utilization in British Columbia."

Circular 16 "Preservative Treatment of Fence-posts."

" 23 "Absorption of Moisture by Kiln-dried Lumber."

" 26 "Creosote Treatment of Douglas Fir."

" 28 "Strength Tests of Creosoted Douglas Fir Beams."

" 29 "Strength Tests of Creosoted Douglas Fir Railway Ties."

" 31 "Strength of Telephone Poles: Eastern Cedar, Red Pine, and Jack Pine."

"The Preservative Treatment of Mine Timbers."

A complete list of publications is available on request.

CANADIAN EXPORT TIMBERS

With respect to information regarding Canadian export timbers, inquiries may be directed to the Canadian Government Trade Commissioner in any of the following countries at the address designated:

COUNTRY	ADDRESS
United Kingdom	Canada House, Trafalgar Square, London, S.W.1. Century Buildings, 31 North John Street, Liverpool. Northcliffe House, Colston Ave., Bristol. 200 St. Vincent Street, Glasgow.
Australia	Box 196C, G.P.O., Melbourne.
British West Indies	P.O. Box 125, Port of Spain, Trinidad. P.O. Box 225, Jamaica.
Irish Free State and Northern Ireland	66 Upper O'Connell Street, Dublin, Irish Free State.
New Zealand	P.O. Box 33, Auckland.
South Africa	P.O. Box 683, Cape Town.
Argentine Republic	B. Mitre 430, Buenos Aires (1).
Belgium	98 Boulevard Adolphe Max, Brussels.
Brazil	Caixa Postal 2164, Rio de Janeiro.
China	P.O. Box 264, Shanghai. Hongkong and Shanghai Banking Corporation Building, Tientsin.
Cuba	Apartado 1945, Havana.
Egypt	P.O. Box 1770, Cairo.
France	3 rue Scribe, Paris (9).
Germany	Monckebergstrasse 31, Hamburg.
Greece	1 Coral Street, Athens.
Hongkong	P.O. Box 80, Hongkong.
India and Ceylon	P.O. Box 2003, Calcutta.
Italy	Via Manzoni Nr. 5, Milan (102).
Japan	P.O. Box F101, Tokyo Central, Tokyo. P.O. Box 230, Kobe.
Mexico	Apartado Num, 126-Bis, Mexico City.
Netherlands	Beursplein 26B, Rotterdam.
Netherlands East Indies	P.O. Box 84, Batavia, Java.
Norway	Jernbanetorvet 4, Oslo.
Panama	P.O. Box 222, Panama City.
Peru	Casilla 1212, Lima.
United States	25 Broadway, New York City.

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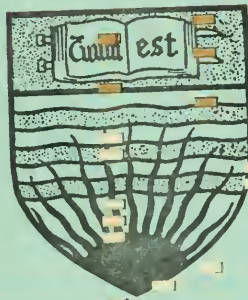
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